

ment varies considerably according to the nature of the pavement laid down, both as respects size of stone and nature of granite, and also according to the price of granite in the market. They may be estimated at from 11s. to 17s. per yard, superficial, if formed of stones 9 inches deep.

The average of the cost of the repairs of thirty-six streets may be taken at about one penny per yard per annum up to the period at which it was estimated.

The stones of these carriageways were 9 inches deep, 6 inches wide, and from 9 to 15 inches long; this, therefore, will not give the probable amount of charge for annual reparation of the pavements (of 3-inch cubes) now laid in the City of London.

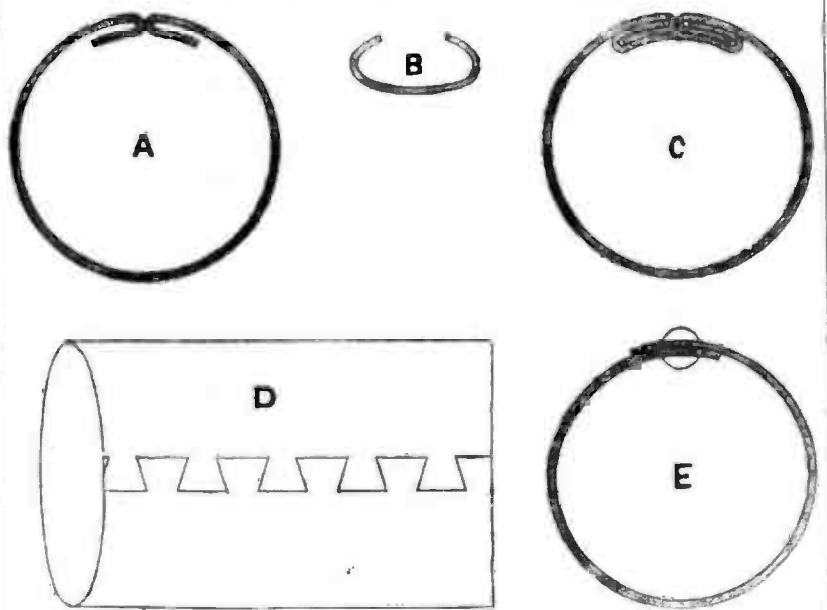
The usual material for footpaths is York stone, the thickness usually laid down is 3 inches, its cost has varied from about 6s. to 6s. 6d. per yard.

The average cost of reparation of the footways of Coleman-street, Bread-street, Fenchurch-street, Fleet-street, Lombard-street, Tower-street, Great and Little, and Wood-street, taken over the period of the whole time they were lying in the streets, is about one penny per yard per annum."

WROUGHT-IRON WATER PIPES.

I OBSERVE in your number for Oct. 27th a letter from Messrs. Fox, Henderson, and Co., on the above subject, and as the statements therein are entirely erroneous, and calculated to do a valuable patent (of which I hold a share) considerable injury, may I beg the favour of being permitted to put the matter in its true light. There are two patents for wrought-iron pipes in this country, as well as in France; viz., M. Ledru's and M. Chameroy's; and that the public may have an opportunity of judging of the intrinsic value of each, I will endeavour to show in what each consists. M. Ledru's system consists in drawing a plate of charcoal iron, by a machine, to any length up to 10 or 12 feet, in section, of a circular form, with its edges curved in, as at A, while another piece of charcoal iron, of the same length, having been drawn of the form as at B, is by a third operation drawn into the pipe, as at C, by which process they are so firmly rolled together that they become almost one entire piece of iron. The pipe thus manufactured possesses these advantages, viz., that it is entirely closed throughout its whole length, without a single break, and is capable of resisting any strain, either from the interior or exterior. These pipes, when made, are galvanized, the zinc running into and entirely filling up the smallest interstices that by any accident may occur, and the outer seam is then soldered the entire length, which, although considered perfectly unnecessary, is done as an additional security. M. Chameroy's system (*vide* patent) originally consisted in cutting out of plate iron a series of dovetails, at certain distances, and bending the plate into a circular form, and then, by solder, endeavouring to fix these dovetails in their places, *vide* D; but as this scheme proved a failure it was abandoned, and the present makers of M. Chameroy's patent in England only rivet the pipes with small rivets at certain distances, as at E, and, I believe, then solder down the joint, which system I humbly conceive is no patent at all, and that any one would be at liberty to make pipes in this manner. M. Chameroy's system also includes the covering of the pipe, when made, with bitumen; this is also common to M. Ledru's system, so that, in this respect, the one has no advantage over the other. Messrs. H. and M. D. Grissell are the manufacturers of M. Ledru's patent in this country, which system unfortunately happens to be an opposing one to that of M. Chameroy. Each pipe as made by Messrs. Grissell is, before delivery, proved with its joint complete, to a pressure of water equal to a column of 300 feet, but the pipe will of course always bear considerably more before fracture. It also, from its peculiar form of abutting joint (thereby keeping its perfect circle), will bear a loaded waggon to be drawn over it, and is guaranteed equal to any cast-iron pipe, when placed in the same situation as pipes usually are. I am not aware to which system the article in your valuable paper of the 29th September last refers, but I have

WROUGHT-IRON WATER PIPES.



the permission of the Messrs. Grissell to say that they will have much pleasure in showing you the manufacture, and in proving my assertions to their fullest extent, should you favour their manufactory with a visit. However, in answer to Messrs. Fox and Co.'s letter, I can, as one of the proprietors of the patent, affirm that M. Ledru has not had to pay any damages to M. Chameroy for infringements, and, as far as I recollect, the trial in question went against M. Chameroy, and not M. Ledru.

I am quite willing to prove, by experiment, that, first, M. Ledru's pipes are equal to the external as well as the internal pressure. Look at the two sections A and E, and let any practical man say which is most likely to sustain pressure. Second, the pipes made according to M. Ledru's system do not depend upon being soldered; it is only an additional security. Third, whatever liability there may be of the outside coating of asphalt being destroyed—of which I think there is very little chance—the liability is equal in both systems, as each party covers his pipes with bitumen if desired. As we galvanize all our pipes, we consider this coating of bitumen quite unnecessary, except in some very peculiar situations, and we do not advise our friends to incur this additional cost. Our pipes are made from half an inch diameter upwards, and are equally applicable for household purposes as for the purpose of drainage and water pipes. Messrs. Fox and Co.'s agent for their pipes is, I think, quite in error in "confirming their impression," *however strong* that impression may be, relative to the defects alluded to. I am informed that, instead of M. Chameroy having to complain of infringements, it is M. Ledru who has had to complain. Messrs. Fox, Henderson, and Co.'s opinion with respect to M. Ledru's system being "valueless," is, however, of little importance. I need only say that I do not fear my pipes will suffer anything by being placed alongside those of any maker in the kingdom. The question that the public will have to settle is—who can produce the best pipe at the least cost?

As regards the screw joint, of which Messrs. Fox and Co., with so much emphasis, say that "their screw joints are not soldered on like Ledru's, but are cast (?) upon the body of the pipe, in such a manner as not to be liable to be detached;"—true, they are not soldered on like Ledru's, but they omit to mention that the metal of which these said joints are composed so nearly assimilates to *solder* itself, that no practical difference can be discovered; whereas the joints I recommend are made either of cast-iron, or of malleable cast-iron, which is as strong as wrought-iron itself. These joints are then galvanized, rivetted on

to the pipes, and afterwards soldered as well. My object is not to depreciate Messrs. Fox and Co.'s pipes—they are fair pipes; but I cannot submit to their assertions without asking the public to judge which of the two systems is the best—M. Chameroy's or M. Ledru's; and I think Messrs. Fox would have shown much better taste had they not so freely made use of a competitor's name to raise the value of their own article. In conclusion, I can only say that I will guarantee every one of my pipes for the term of seven years, whenever required to do so, and thus allow time alone to test their value."

JOSEPH THOMAS.

Miscellaneous.

BITS OF THE PAST.—A portion of Roman walling, we are told, has been discovered in Chelmsford. "The walls exposed are 3 ft. thickness, and 4 ft. 8 in. in depth, and are formed of Roman bricks about 12 in. by 11 (of which there are twenty rows), mixed with fragments of curved roof-tiles, similar in form to those now used on Italian villas."—At Llando, Wales, the miners have broken into a cavern supposed to have been formed in Roman times: benches, stone hammers, &c., were found.—At Richborough, according to the *Literary Gazette*, the outer wall of a very extensive amphitheatre has been discovered and traced by Messrs. C. R. Smith and Rolfe.—*La Presse* mentions the discovery, on the walls of La Sainte-Chapelle, adjoining the Palace of Justice, Paris, of a rude painting of the thirteenth century, on a preparation of gold. It was hidden under three coats of yellow chalk, and represents the annunciation. The figures are about 4 ft. (French) in height, and consist of an angel presenting a branch of lily to the Virgin, who holds a book in her hand. Above is a medallion of the Virgin, with the infant Jesus on her knees, and two angels offering incense.—A marble statue, almost entire, and supposed to represent either Apollo or Meleager, has been found during excavations that are being made for antiquities in Rome.

GALVANIZED IRON COMPANY.—We have been requested to correct the misapprehension of a contemporary relative to this company, quoted in our last. The manager, Mr. Tupper, states that the affairs wound up were those of the *old* company, and that the present company are fully prepared to develop the process to the utmost.

* Having now allowed both parties to state their case, any further communication can appear only as an advertisement.—Ed.